

Option Switches

Byte-swap bug option

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This note describes the uses of the set of 8 option switches that are mounted on the Crate Utility Board, on the IRM front panel, or on the DPMC Access Board. The Crate Utility board is used whenever “little console” hardware is part of the front end configuration.

IRM configuration

Every 68K-based IRM includes a Digital IP board that connects to hardware on the front panel of the IRM chassis, including option switches, a set of 8 diagnostic LEDs, a diagnostic test points connector, and a serial port connector. A set of connectors on the rear of the IRM chassis provide for interfacing to analog and digital I/O, the clock, and ethernet.

VME 68K configuration

Nearly all 68K systems are in the IRM configuration, but a few of them have no digital I/O and only need a clock signal, for which a dummy VME board serves. Such systems have no option switches. The software reads them as all 1's, except for bits 7, 6, which are both assumed 0. (This means that they cannot be booted into 162Bug, nor can the “stand-aside” mode be selected.) A search of about 200 nodes found only 7 that are set up this way: nodes 0508, 056C, 05A1, 060A, 060B, 06CB, and 06CF. Node 0508 is the 68K library node, nodes 056C and 05A1 are installed at A0, nodes 060A and 060B are installed in the preaccelerator domes, and nodes 06CB and 06CF are in the Booster HLRF RCC racks.

VME PowerPC configuration

Each PowerPC-based front end includes a Digital PMC board mounted on the CPU board, plus a corresponding DPMC access board to provide external connections for the clock, option switches, interrupt LEDs, and diagnostic test points. A short ribbon cable connects from the access board to the CPU board. For such front ends that need to support a little console, a Crate Utility Board is included. Although the CUB has its own set of option switches, they are ignored in this configuration.

Option switch usage

The option switches are arranged vertically, the most significant (bit 7) uppermost. (In IRMs, the switches are horizontal with bit 7 to the left.) In 68K-based systems only, bit 7 is set to allow entry into 162Bug at boot time; otherwise, the front end system software starts up.

In either 68K or PowerPC systems, bit 6 is set to enable “stand-aside” mode, which means that the system runs *without* performing three key duties:

- Auto-restore of settings at boot time.
- Data Access Table processing to update local data pool each cycle.
- Alarm scanning each cycle.

In this limited mode of operation, one can perform a restore of nonvolatile memory tables from previously saved files of same. These may include the ADATA table that houses setting values as well as alarm limit parameters. Note that lack of Data Access Table processing means that no local applications will run. This implies that network protocols such as ACNAUX and FTPMAN are not working. But basic CLASSIC and RETDAT protocols are. The CLASSIC protocol is used for the nonvolatile memory restore operation.

Once the restore operation is complete, one should reset the stand-aside switch to 0 and boot. The auto-restore of settings will take place, so that the hardware reflects the saved settings,

and the data pool is updated each cycle, followed by the alarm scanning that is based on it.

Option switches 5 and 4 are used together—in 68K systems only—to signal the underlying RETDAT support software that a bug is not to be allowed to adversely affect Basic Status Property data when 4 bytes are requested. To enable this mode, switch 5 should be set and switch 4 should be reset.) (It would be better to fix the bug, but by the time it was detected, too many Acnet data base entries relied on it. Perhaps we can make this adjustment soon, which would allow removing this “feature” from the code entirely.) See the separate note, *Basic Status Property*, for more details on this.

The remaining option switches, bits 3–0, are not used at all.

In summary, the option switches mainly include bit 7 that is used in 68K systems to force exit into 162Bug at boot time, and bit 6 that places the system in “stand-aside” mode after a boot. Switches 5 and 4 are used in 68K systems when 4 bytes of status must be supported. At the present time, only six 68K nodes need this option.